

## ABSTRACT

In a vessel containing a filter bed and containing a mixed liquor containing suspended solids, a system disturbs/dislodges a sludge mat that settles on the filter bed. Thus, the system controls the sludge mat on the filter bed that otherwise may blind the filter bed and significantly reduce or stop process liquid flow into and through the filter bed. The system helps maintain effective vessel effluent flowrates with reduced requirements for filter bed backwashing or other filter bed maintenance. The system includes a sludge mat dislodging member that moves along the filter bed surface, preferably on but substantially not inside the filter bed, to disrupt/dislodge the sludge mat and/or prevent formation of the sludge mat. Preferably, the dislodging member is carried inside the vessel on a moving arm or arms that rotate in a plane parallel to the filter bed surface. The preferred sludge mat dislodging member(s) hang from the rotating arm(s) to slide along the top of the filter bed through the sludge mat. The sludge mat control methods and apparatus preferably are used during normal operation of the reactor/vessel, without requiring shutdown or interruption of the process. The methods and apparatus may be effective in sludge blanket microbial remediation reactors that require high flowrates of liquid effluent due to low residence times in a given vessel.

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